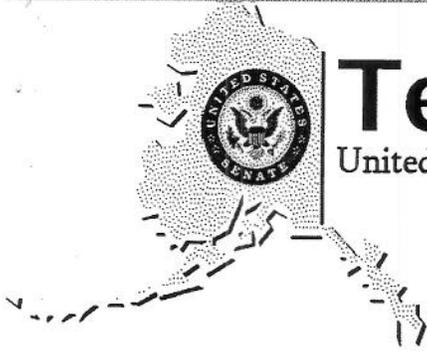


Submission Date: Feb 15, 2008

Priority: 1 of 3



# Ted Stevens

United States Senator for Alaska

## Please Note:

- Fill out one request form for each request
- This form (and any attachments) can be returned via:

Fax - (202) 224-2354

Mail - The Honorable Ted Stevens  
United States Senate  
522 Hart Senate Office Bldg.  
Washington, D.C. 20510

- Requests are due by February 15, 2008.

## FISCAL YEAR 2009 PROJECT REQUEST FORM

Project Name: NOAA Critical Fisheries Data Archiving and Automated Analysis Demonstration Project

Project Location: NE Fisheries Science Center, Woods Hole, MA in conjunction with Alaska owned and operated Biopar, LLC

Project Description (please attach additional pages as required):

See Attached

Related Appropriations Bill: CJS - NOAA

Amount of federal funding requested for FY09: \$349,000

Total funding to complete this project: \$349,000

Number of years to fund this project: 1

Matching funds from the State of Alaska: \$0

Matching funds from local and private entities:

A portion of salaries, benefits and overhead are being provided as "in kind"

If this project was funded in prior appropriations bills (within the last five years), list each bill and the amount funded:

NA

Amount included in the President's FY09 Budget: \$0

Amount included in the State of Alaska FY09 Budget: \$0

 Check this box if state funding was sought but not provided.

List legislation that authorizes this project:

NOAA Organic Act; Magnuson Stevens Reauthorization Act

## Check all that apply:

- A change in the current law is necessary in order to proceed with the project. (If so, attach language and a list of laws that need to be amended)
- Bill or report language is needed. (If so, attach requested language)

See attached for project explanation and justification.

In addition for agency contact info we have been seeking input from:

**Biopar/NOAA Critical Reference Species Collection and Automation Demonstration****Preliminary Budget****Phase I: Preliminary Pilot Demonstration**

Equipment	\$	70,000
Salaries	\$	-
Benefits	\$	-
Overhead	\$	-
Travel	\$	3,500
Algorithmic Development and Testing	\$	5,000
Database Development	\$	15,000
Contingency	\$	1,000
<b>Total</b>	<b>\$</b>	<b>94,500</b>

**Phase II: Full Haddock and Yellow Fin Archive Analysis and Otolith Preliminary**

Equipment	\$	-
Salaries	\$	20,000
Benefits	\$	5,000
Overhead	\$	5,000
Travel	\$	5,000
Algorithmic Development and Testing	\$	5,000
Database Maintenance	\$	7,500
Contingency	\$	5,000
<b>Total</b>	<b>\$</b>	<b>52,500</b>

**Phase III: Full Reference Collection Digitization and Critical Historical Data**

Equipment Usage	\$	122,000
Salaries	\$	20,000
Benefits	\$	5,000
Overhead	\$	5,000
Travel	\$	10,000
Software Licensing	\$	-
Database Maintenance	\$	20,000
Contingency	\$	20,000
<b>Total</b>	<b>\$</b>	<b>202,000</b>

<b>Grand Total</b>	<b>\$</b>	<b>349,000</b>
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**ration Project**

**inary Work**

**Securitization**

## **Biopar/NOAA Critical Reference Species Collection and Automation Demonstration Project FY 09**

### **Project Description**

This project, in conjunction with staff at NOAA, is comprised of three parts or phases all leading toward the ultimate end goal:

#### **Phase I: Preliminary Pilot Demonstration**

The purpose of this phase is demonstration the speed and accuracy of proprietary automated fish scale digitization and analysis for fish aging and potential stock identification work. Phase I is intended to demonstrate to the agency that speed and accuracy of the proprietary equipment, handling machinery and software algorithms can increase fish scale analysis by nearly 100 times compared to current human scale readers.

Included in Phase I will be an establishment of the baseline analysis required to create the archetype references for database population and analysis, compare human reader notes from the archives and double check new samples against the newly created archetype reference. Also included will be the development and cross-checking of new aging standards using the same system. An automated, artificial intelligence-based scale aging and analysis system eliminates human-derived error and variability, and increases speed over 100-fold of all currently employed systems and methods.

According to NOAA staff the two species of most critical importance for testing are haddock and yellow tail flounder in the NE. These will be the two species of focus for Phase I and Phase II.

#### **Phase II: Full Haddock and Yellow Fin Archive Analysis and Otolith Preliminary Work**

According to agency staff, a positive Phase I outcome will warrant full digitization of their haddock and yellow fin scale archives to demonstrate further speed and accuracy and to create an agency-wide database accessible to scientists in the office and across the entire NOAA system nationwide. In addition they want to demonstrate that an automated and algorithmic approach to aging for their vast otolith collection. This preliminary otolith work will be part of Phase II in order to prepare the agency for application of the technology to species without scales or to species where the agency has a large otolith reference collection.

#### **Phase III: Full Reference Collection Digitization and Critical Historical Data Securitization**

Currently all the scale and otolith data residing in the federal in the NOAA libraries around the country exists on tapes and cards. While better than storing scales and otoliths in their native state, these archival media are vulnerable to a variety of hazards. In fact, recently, a large section was lost to water damage. NOAA would like to make digital copies of all these reference scales. Doing so means that numerous digital copies could be housed at different sites, thereby eliminating any possible loss. In addition, having easily duplicated digital images makes that data available to scientists throughout the NOAA system.

Currently if a scientist or researchers needs access to scale information they must call the reference librarian and ask for actual physical scale samples to be pulled and sent for their review. This is very time consuming, and jeopardizes the integrity of the collection, and limits the usefulness of the samples. NOAA is looking for a fast and cost effective way to create digital copies of the physical specimens in case of a catastrophe at its libraries. One flood, one fire, one accident could cause decades worth of irreplaceable biological samples to be lost forever.

Phase III would include parking the proprietary equipment at the NOAA facility for a pre-determined amount of time, allowing them to digitize as much of their collection as they have funds for. Once the algorithms are complete and tested, work can begin to re-analyze the age, (and probably stock identification), data using an unbiased, consistent method for the entire national collection.

### **Project Justification and Federal Purposes**

Currently fish scales and otoliths are aged by people using microscopes. This work is tedious, slow and plagued by within and between-reader variability. Because it is so labor intensive, it is very expensive work. The results often conflict with other agencies' and user-group's results, elevating the conflicts of already politically-charged issues..

This is a critical issue for federal, state and tribal fisheries managers who rely on scale and otolith aging data to provide updated field research, expert testimony, environmental and biological opinions, harvest forecasts and responses to inquires by interests groups looking to expand or restrict fisheries.

The Federal Government spends a great deal of money on each human scale reader. The variability in the skills of these readers is highly correlated to their experience, yet because of the tedious nature of the work, and the relatively low wages paid scale readers, there are few readers nationally that can produce consistent results. Automating the system ensures consistent results and increases throughput by 100-fold. This is of great interest to NOAA staff (A good human reader can read about 100 scales per day. The automated system can do 12,000 per day.) The ability to also identify scales and otoliths to stock depending on location and species, without the expense and time delay of genetic stock identification is of great interest. The cost and time involved with training a human reader is a significant problem for the agency. Automating the process with an artificial intelligence-based system eliminates this problem.

This technology can result in quasi-real-time management of fisheries that rely on scale-based information, reduce human capital and training costs, eliminate human-based variability and result in more informed management decisions.

It is of great interest to NOAA staff.

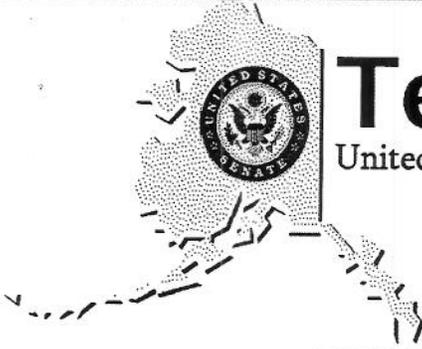
### **Advisory Note**

The submission of this proposal should not be viewed as an attempt by potential partner agencies as a means to circumvent appropriations and lobbying restrictions. The entity, department and

agency references in this application are for information purposes only. No state institution or federal agency, nor any employee thereof, asked Biopar to submit this application on their behalf. Rather, Biopar sought on its own to put together a team of qualified and interested parties that could deliver the necessary data in a qualified and competent manner.

Submission Date: Feb 15, 2008

Priority: 2 of 3



# Ted Stevens

United States Senator for Alaska

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## FISCAL YEAR 2009 PROJECT REQUEST FORM

Project Name: Continuation of Threatened &amp; Endangered Species, Fisheries Report Language

Project Location: Report Language - US Fish &amp; Wildlife Service; NOAA/NMFS

## Project Description (please attach additional pages as required):

This continues and expands existing report language encouraging the US Fish and Wildlife Service to use non-invasive biological pattern recognition for threatened and endangered animal species and projects. This technology is faster, cheaper and less invasive than existing physical tagging technologies. We are asking that the language be continued and expanded to be included in both the Interior Report for US Fish & Wildlife and in the CJS Report for NOAA/NMFS.

Specific language we are seeking for both bills/reports: "In addition to other established methods, the [Department/Agency/Service] is encouraged to demonstrate and utilize biological pattern recognition technology where appropriate for tagging fish or threatened or endangered animal species."

Related Appropriations Bill: CJS (NOAA); Interior (US Fish &amp; Wildlife)

Amount of federal funding requested for FY09: NA - Report Lang.

Total funding to complete this project: NA - Report Lang.

Number of years to fund this project: NA

Matching funds from the State of Alaska: NA

Matching funds from local and private entities:

NA

If this project was funded in prior appropriations bills (within the last five years), list each bill and the amount funded:

FY 08 - Consol. Approps Act - Department of Interior Report - Page 7

Amount included in the President's FY09 Budget: NA

Amount included in the State of Alaska FY09 Budget: NA

 Check this box if state funding was sought but not provided.

## List legislation that authorizes this project:

FY 08 - Consol. Approps Act - Department of Interior Report - Page 7

## Check all that apply:

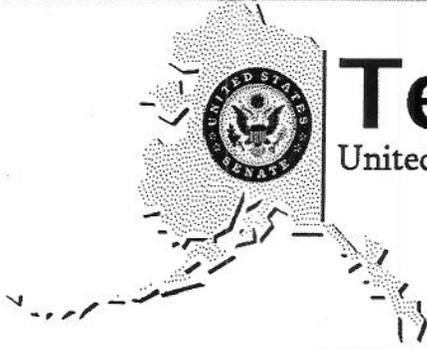
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- Bill or report language is needed. (If so, attach requested language)

See attached for project explanation and justification.

In addition for agency contact info we have been working with:

Submission Date: Feb 15, 2008

Priority: 3 of 3



# Ted Stevens

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## FISCAL YEAR 2009 PROJECT REQUEST FORM

Project Name: Alaska Walrus Non-Invasive Population and Tagging Automation Technology

Project Location: Arctic Alaska; Anchorage; Alaska Fisheries Science Center; NOAA HQ

Project Description (please attach additional pages as required):

See Attached

Related Appropriations Bill: CJS (NOAA); Interior (Fish &amp; Wildlife Service)

Amount of federal funding requested for FY09: \$4.75 Mil

Total funding to complete this project: \$4.75 Mil

Number of years to fund this project: 1

Matching funds from the State of Alaska: \$0

Matching funds from local and private entities:

Certain private sector salary and benefits will be provided as "in-kind" contributions

If this project was funded in prior appropriations bills (within the last five years), list each bill and the amount funded:

NA

Amount included in the President's FY09 Budget: \$0

Amount included in the State of Alaska FY09 Budget: \$0

 Check this box if state funding was sought but not provided.

List legislation that authorizes this project:

MMP; MSA Reauth; FY 08 Consolidated Appropriations Act - Dept of Interior (Page 7 of the Report)

## Check all that apply:

- A change in the current law is necessary in order to proceed with the project. (If so, attach language and a list of laws that need to be amended)
- Bill or report language is needed. (If so, attach requested language)

## **Alaska Walrus Non-Invasive Population and Tagging Automation Technology FY 09**

### **Project Description**

This project will utilize the combined talents of several public and private sector entities. Recently private sector non-profit environmental groups filed petitions with the US Fish and Wildlife Service asking that walrus in Alaska (the Arctic) be listed as threatened or endangered species due to the loss of ice packs in the Arctic from "global warming" and the resulting decline in populations.

This project will fund: 1) Unmanned Aerial Systems (UAS) and Unmanned Aerial Vehicles (UAVs) deployed by the University of Alaska, Fairbanks Geophysical Institute, 2) professional staff at the Alaska Fisheries Science Center in Seattle focused on marine mammals and 3) private sector technology to provide automated population counts and individual animal identification using biological pattern recognition techniques in a non-invasive manner from video and pictures captured by the UAS/UAVs.

The FY 08 Consolidated Appropriations Act report language for the title for the Department of the Interior encouraged the US Fish and Wildlife Service to use new and emerging non-invasive biological pattern recognition technologies to tag and track threatened and endangered species. Biopar, LLC (an Alaska owned and operated company) has the leading patent pending proprietary technology to provide accurate populations counts (actual counts, not estimates) and to provide individual identification of animals using digital photography and videos.

Rather than seeking permits to physically tag walrus with current mutilation tags, branding, tagging guns, etc, Biopar would simply use photography and video gathered by university/government UAS/UAV vehicles to provide accurate and precise individuated data about each animal captured on video. In addition, large scale flyovers using the UAS/UAV with the proper camera equipment would allow Biopar to use its proprietary population counting technology to provide scientists with the latest state of the art data on walrus populations. Again, without the need to touch or get close to the animals.

### **Justification/Importance to the Federal Government**

Environmental groups are using the "declining" walrus population as the next species to both oppose oil and gas development in the Arctic/OCS and to argue for comprehensive global warming consultation up and down the entire West Coast of the US. One of the major justifications for such filings is the lack of data surrounding the "collapse" of the walrus populations.

As we have seen in the fisheries in Prince William Sound and the Gulf of Alaska these environmental groups also use this "lack of data" to argue for the closure of fisheries. At the same time these groups oppose efforts by federal agencies to issue permits to "tag" species under review, such as the efforts to oppose or sue NOAA for issuing permits to "brand" stellar sea lion in Prince William Sound near Resurrection Bay. On the one hand they argue that species are in the decline while on the other hand they oppose certain efforts to gather data about the species.

To head this off at the pass we propose to use a combination of public and private sector resources to gather data that has never been available before by using "non-invasive", "non-mutilating" techniques. Video and photos gathered by cameras equipped on UAS/UAVs will be fed to the private sector partner with the proprietary technology to both count the animals in the photos

automatically and to provide initial and repeatable individual identification without the need for special "handling permits".

This approach will also provide a buffer against suits about the "treatment" of animals since no animal was ever killed with a photograph. In addition, the departments and agencies involved will be able to respond to inquires and potential suits by telling concerned parties and managers that they are deploying "new and emerging technology" that could yield more data than ever thought possible without need to physically touch the animals.

Finally, the ability to both capture such new data and to rebuff frivolous complaints could help keep oil and gas development moving forward. This combined effort, in totality, is in the State, Federal and private sector interests.

#### **Advisory Note**

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